We claim:

1. A method for correcting height errors on a substrate, comprising altering the density of a region selected from the group consisting of at least a portion of said substrate and at least a portion of a coating on said substrate, wherein an expansion or contraction of said region is produced such that the height of said region changes by an amount needed to mitigate surface height error.

2. The method of claim 1, wherein said coating comprises a multilayer.

3. The method of claim 2, wherein said multilayer comprises a Mo/Si multilayer.

4. The method of claim 2, wherein said expansion or contraction results from a reaction selected from the group consisting of (i) interdiffusion

and (ii) a chemical reaction of neighboring layers of said multilayer, wherein said reaction results in a net change in density, which results in a change in height of a surface of at least one layer of said multilayer.

5. The method of claim 1, wherein the step of altering the density of a region includes depositing energy into said region.

6. The method of claim 1, wherein the step of altering the density of a region includes depositing thermal energy into said region.

7. The method of claim 6, wherein the step of depositing thermal energy includes depositing laser energy.

8. The method of claim 6, wherein the step of depositing thermal energy includes bombarding said region with an electron beam.

9. The method of claim 6, wherein the step of depositing thermal energy includes bombarding said region with an ion beam.

10. The method of claim 1, wherein the step of altering the density comprises bombarding said region with atoms.

11. The method of claim 7, wherein the step of depositing laser energy is carried out with an excimer laser.

12. The method of claim 1, wherein expansion or contraction of said region is localized to at least one area delineated by spatial extent.

13. The method of claim 12, wherein said at least one area comprises pixels

14. The method of claim 1, wherein the step of altering the density of a region is controlled as a function of time.

15. The method of claim 6, wherein the step of depositing thermal energy is controlled as a function of time wherein a desired height change is proportional to the duration of the step of depositing thermal energy.

16. The method of claim 5, wherein the step of altering the density of a region is controlled as a function of the intensity of energy deposited into said region.

17. The method of claim 13, wherein said pixels comprise an abrupt spatial boundary.

18. The method of claim 17, wherein said abrupt spatial boundary comprises a geometric shape.

19. The method of claim 13, wherein said pixels comprise a non-abrupt spatial boundary.

20. An apparatus for mitigating a height error on a substrate, comprising:

an interferometer for measuring the figure of a substrate with a surface that has a height error; and

a mechanism for altering the thickness of a thin film coating, deposited over substantially all of said surface, to obtain a desired figure.

21. The apparatus of claim 20, further comprising:

a holder to hold said substrate; and

a deposition mechanism for depositing said thin film coating over substantially all of said surface;

22. The apparatus of claim 20, further comprising a mechanism for depositing a multilayer coating onto said surface.

23. The apparatus of claim 20, wherein said mechanism for altering the thickness of said thin film coating comprises a mechanism for altering the localized surface figure of said substrate.

24. The apparatus of claim 20, wherein said mechanism for altering the thickness of said thin film coating comprises a mechanism for altering the density of said substrate.

25. The apparatus of claim 24, wherein said mechanism for altering the density comprises an apparatus for depositing energy onto said surface.

26. The apparatus of claim 25, wherein said apparatus for depositing energy comprises a laser.

27. The apparatus of claim 25, wherein said apparatus for depositing energy comprises an ion beam source.

28. The apparatus of claim 25, wherein said apparatus for depositing energy comprises an electron beam source.

29. The apparatus of claim 25, wherein said apparatus for depositing energy comprises an atomic beam source.

30. The apparatus of claim 22, wherein said multilayer comprises alternating layers of Molybdenum and Silicon.

31. The apparatus of claim 21, wherein said thin film coating comprises silicon dioxide.

32. The apparatus of claim 26, wherein said laser comprises an excimer laser.

33. A method for altering height error on a substrate, comprising:

depositing a thin film coating on the surface of a substrate that has a height error;

measuring the figure of said surface; and

altering the thickness of said thin film coating in the vicinity of said height error to obtain a desired figure.

34. An apparatus for altering a substrate height error, comprising:

means for depositing a thin film coating on the surface of a substrate that has a height error;

means for measuring the figure of said surface; and

means for altering the thickness of said thin film coating in the vicinity of said height error to obtain a desired figure.